



**The
Imperial Forestry Institute
University of Oxford**

SIXTEENTH ANNUAL REPORT

1939—40

Oxford

THE HOLYWELL PRESS, LTD.

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INSTITUTE

1939-40

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UNIVERSITY OF OXFORD

SIXTEENTH ANNUAL REPORT OF THE IMPERIAL FORESTRY INSTITUTE ACADEMIC YEAR, 1939-40

INTRODUCTION.

The new organization introduced with the beginning of the year under report has not had long enough or conditions normal enough to reveal fully its merits and demerits, and it will suffice to record at present that the now unified control has greatly facilitated administrative work and that all arrangements have been made to start on the new syllabus of work in the Michaelmas Term, 1940.

Mr. Day continued to act as Deputy-Professor till the arrival of the present writer in April. Mr. Foggie, seconded from the Colonial Forest Service for a period of two years and three months, was appointed to the vacant post of Departmental Demonstrator and Lecturer in Forest Mensuration and Management, and took up his work on 27th April, 1940. Mr. Foggie went out in 1929 from Edinburgh to Cyprus and was transferred to the Gold Coast in 1936, so that he has experience of service under two very different sets of conditions. His appointment is particularly welcome as strengthening the staff in foresters with practical experience in a Forest Service.

The Institute has incurred a great loss in the death on 20th August, 1940, of Dr. Burt Davy. He had retired on September 30th, 1939, but volunteered for a further year's service without emoluments, and continued to deal with all work connected with Tropical Ecology. Dr. Burt Davy will long be remembered by the many students passing through the Institute, and the results of his teaching are already apparent in the valuable botanical work being done by many of them into whom he instilled some of his own enthusiasm for his subject. Some account and appreciation of his services to the Institute were given in last year's Report.

In accordance with the University's general policy of granting facilities to students about to be called to Military Service, special examinations were held in January, 1940; after sitting for these a number of students left the Institute. The usual degree examinations were held in June and were taken by students in their second and third years.

Few Institute Papers were printed during the year for reasons connected with the war, and further parts of the Forest Bibliography could not be published. Two Institute Papers, Nos. 21 and 22, were published with the following titles:—

No. 21. Calculation of the value of the soil in forestry and calculation of the financial rotation of a forest stand, by Sven Petrini.

No. 22. Ecological succession due to biotic factors in Northern Kano and Katsina Provinces of Northern Nigeria, by W. A. Fairbairn.

It is believed that the work on Colonial Forest Administration on which Professor Troup was engaged at the time of his death will be published in the near future.

GENERAL.

Under the system by which the Colonial Forest Service probationers are sent back to the Imperial Forestry Institute for a further period of study, six students attended. The several Colonies were represented as follows:—

British Honduras	...	...	...	...	1
Gold Coast	...	...	...	...	2
Malaya	...	...	...	...	2
Trinidad	...	...	...	...	1

No Forest Officers on leave took Refresher Courses this year, but Mr. R. G. M. Willan worked in the Herbarium under Dr. Burt Davy's supervision in the Michaelmas Term.

Professor N. L. Rao, Assistant Professor of Botany at Bangalore, India, has worked on the wood anatomy of certain genera of Santalaceae, under Dr. Chalk, during the Long Vacation.

During the year two of the old School of Forestry undergraduates took the Special Examination in Forestry in January, 1940, and four took a Special Final Examination in June, 1940.

No tour on the Continent was possible this year owing to the war, and plans to substitute a tour in Britain proved impracticable, but the probationers attended the Working Plan Tour arranged for the undergraduates in the Forest of Dean in the Easter Vacation.

The customary excursions to study practical silviculture and mensuration were made in Trinity Term.

During the Summer Vacation, a number of forest research parties were organised from volunteers at this and other Universities. The general object in view was to collect the valuable

data offered by the many woods which were being clear-felled to meet the war demands, data which would otherwise be irretrievably lost. A project was put before the Forestry Commission, and they made available a block grant of £1,500 for the work. The project aimed primarily at correlation of growth and timber defects with site factors, and to cover the fields involved each party normally consisted of four members dealing with ecology, soil science, pathology and forestry, with a general assistant when possible. Fellings were visited to a radius of about fifty miles from headquarters, mostly on day trips by car, the attempt being made to deal fully with one plot each day. Seven such parties were in the field during most of the vacation and put in very strenuous work, nearly all completing the forty plots originally hoped for. The general organization was undertaken by the Professor, and many of the Institute staff were engaged on the work. Two parties were formed in Oxford by the Departments of Botany and Forestry and the School of Rural Economy. The other parties were formed by the research staffs, mainly of the Botanical Departments, of Cambridge, Bristol, Bangor, Manchester and Newcastle. The commonest difficulty in getting together a team was to find a forester to do the mensuration and silviculture, and in several parties this work was taken on by another member after receiving instructions in what was wanted. Offers of co-operation were received from other University centres, but it proved impossible to get together a complete team.

The close collaboration of the Departments of Botany and Rural Economy contributed very largely to the successful carrying out of this programme of field work, and will be equally valued in the compilation and analysis of data collected.

SILVICULTURE.

All the teaching of general silviculture, mensuration and management was done by Dr. E. W. Jones, whose time was fully taken up with this work mainly with students in the second year under the old syllabus. Classes were also run for officers back after service in the Colonies, and dealt mainly with fundamental ecological concepts and the ecological aspects of forestry.

Mr. R. G. Sanzen-Baker remained attached to the Institute in his capacity on the Forestry Commission of Research Officer for England and Wales. War conditions and consequent reduction of field staff have prevented expansion of research work in certain directions; on the other hand, special problems associated with war fellings and timber utilization have arisen. The widespread felling for war purposes of woodland, especially

plantations, has increased the need for research into methods of accelerating the establishment of new plantations. This is at present the main function of the branch; the work begins in the forest nursery and is continued in the plantation.

Nursery experimental work is carried out principally at Kennington Nursery and at Bagley Wood Nursery, both near Oxford, but also at a number of the research nurseries in different parts of the country. The nursery in Bagley Wood has been extended during the year by kind permission of St. John's College, and a small new nursery on woodland soil has been established in East Anglia.

The aim of nursery research work is to improve the quality of planting stock and to increase the production thereof. With this object, investigations have continued into such matters as maintenance of nursery fertility, treatment of seed, methods of sowing, types of seed covering, the use of various seed-bed mediums such as peats, humus and composts, incorporated with the soil; in the latter connection, quantities of soil from a number of woodland sites have been imported into Kennington Nursery. The mycorrhiza problem has received considerable attention with the co-operation of Dr. M. C. Rayner and Dr. I. Levisohn of Bedford College, London. It is interesting to record that the new nursery in Bagley Wood is producing beech plants with a very much finer mycorrhizal equipment than is obtainable in Kennington nursery.

Facilities were afforded on an increased scale at Kennington nursery to Mr. J. M. B. Brown for his studies on the cockchafer problem, also to the University Department of Botany in connection with work on beech mycorrhiza which is being conducted by Dr. J. S. Harley.

The programme of forest experiments was of necessity somewhat curtailed, but all experiments for which plants had been specially raised or which formed part of a series or of a special line of investigation were carried out. A considerable number of plots were laid out in three Welsh forests in furtherance of the European larch provenance studies to which special attention has been paid. The earlier plots are now presenting some interesting data pointing definitely to the superiority of larch raised from Scottish seed as opposed to most of the European races. This appears to be due to natural selection under severe climatic conditions.

Certain lines of investigation have continued in collaboration with Mr. W. R. Day, for example, the enquiry into the cause of die-back and subsequent death which is taking place in European larch plantations about ten years old in several Welsh border counties. The investigation into the afforestation of

exposed chalk downland has continued, Dr. Rayner's department assisting. Plots of several new species of poplar were planted in the Poplar Garden at Yardley Chase in Northamptonshire.

The research work into the afforestation of poor *Calluna* moorland continues, as also does that regarding high elevation planting in the Peak District. Dr. Rayner and Dr. Levisohn are collaborating with Mr. Sanzen-Baker in both these projects. By using organic composts it is possible to raise on heath and moorland sites planting stock of pines better from the mycorrhizal equipment point of view, than in the regular forest nurseries. Two small-scale nurseries have been established on such sites. Work has also been extended to include birch and Sitka and Norway spruces. Considerable success has been achieved with the use of composts prepared with *Molinia* and bracken, particularly the former. Composts are now being prepared on a relatively large scale at Kennington nursery.

A series of experiments was started on the seasoning of pit-props. Four species were dealt with and results over the summer seasoning period are strongly in favour of immediate peeling of the props after felling and cross-cutting, followed by a period of eight to ten weeks' seasoning in the stack. This results in a loss of weight of 40-50 per cent. of the over-bark weight as against approximately 10-20 per cent. in the case of unpeeled props.

It is unfortunate that a considerable number of permanent forest sample plots on private estates have been felled in the course of war fellings. In most cases this was unavoidable on account of the clearing of surrounding plantations. The work of thinning and remeasuring plots was carried out according to programme and some twenty plots were dealt with, a number of these receiving their final measurement.

The arrangement with St. John's College regarding the supervision of Bagley Wood has proved satisfactory and has been continued; preparation of produce mainly from thinnings has been carried out on an extensive scale, including the preparation of charcoal in portable iron kilns. A considerable amount of useful thinning work has been undertaken by undergraduates during the summer term and long vacation.

By arrangement with the Forestry Commissioners six work camps for Oxford undergraduates were held during the long vacation. Much of the work of organizing these camps was undertaken by Mr. Sanzen-Baker. Over 800 volunteers were accommodated in these camps for varying periods from a fortnight to three months.

There has been an increase in the number of enquiries regarding afforestation and woodland management, and in some cases visits were paid to the areas concerned.

MENSURATION AND MANAGEMENT.

As mentioned under Silviculture, Dr. E. W. Jones undertook most of the teaching work in mensuration and management. Mr. A. Foggie took over his duties as lecturer and demonstrator in these subjects during the Trinity Term and gave a few lectures on working plans. When it was evident that the usual summer Continental Tour was out of question, all necessary arrangements were made for a short tour in English woods selected as instructive for management problems. Mr. Foggie visited and drew up notes on the following woods:—Windsor Great Forest and Alice Holt in Hampshire, Buriton, West Dean Estate Woods, Cowdray Estate Woods, and Goodwood and Bedebury Forests in Sussex. This plan also had to be dropped owing to the gravity of the situation.

During the Easter Vacation, a working party was organized in High Meadow Woods in the Forest of Dean. The Colonial Service probationers also joined this party for soil survey work, Mr. Clarke of the School of Rural Economy being present to give instruction in the field. Excursions were made weekly during the Trinity Term as usual. With so full a time-table, systematic research work was obviously impossible for Dr. Jones, but the appointment of a demonstrator for mensuration and management will permit of some research work being done in both this and the silvicultural field.

SOIL SCIENCE.

In the Michaelmas Term, Mr. Morison gave lectures and demonstrations to students who were completing their course under the old regulations. Mr. Clarke held a class with field work for Forest Service probationers who had returned for a further course of instruction. In the Hilary Term, Mr. Morison lectured to the same probationers on Tropical Soils.

Soil Survey work in the Forest of Dean was carried out during the Easter Vacation under the direction of Mr. Clarke.

FOREST BOTANY.

There is no longer a Botanical Section of the Institute since the transfer of this branch of its activities to the Department of Botany, but mention is required of several matters connected with the Institute.

During his period of voluntary service, Dr. Burt Davy worked with Dr. Hora on the Check-list for Tanganyika Territory. Proofs have been checked for the alphabetical list of families and genera, and the list of botanical names with their vernacular equivalents; proofs have also been checked for the first half of the list of vernacular names with their botanical equivalents, and it is hoped that it will be possible to issue Part I of the Check-list in the near future. After the end of the year, Mr. J. P. M. Brennan was appointed to work on the completion of this Check-list.

Dr. Burt Davy also worked in collaboration with Mr. B. J. Rendle of the Forest Products Research Laboratory, Princes Risborough, in checking nomenclature, etc., for 'British Standard Nomenclature of Hardwoods' issued by the British Standards Institution.

It has to be noted also that even if work is started in the near future on the new Botanical Department building, it will only be on a reduced scale with no provision for housing the Forest Herbarium and staff, so that both will have to remain with the Institute for several years more despite the serious shortage of space.

FOREST PATHOLOGY.

Mr. W. R. Day continued in charge of the Section, assisted by Mr. T. R. Peace until November, 1939. After that time Mr. Peace was seconded for duty with the Forestry Commission as District Forest Officer in Division 7. Mr. P. A. Town, the junior laboratory assistant, left owing to the war and was not replaced; Mr. F. H. Jones, the senior assistant, has continued to carry out field work under supervision, in addition to his general duties in the laboratory.

Elm Disease. Mr. T. R. Peace carried out the annual survey of this disease, but owing to heavy pressure of work has been unable to prepare the Report as yet. It can be stated, however, that the disease was more prevalent than in 1939, and rather more severe. The increased severity was to be expected in view of the comparatively hot, dry summer experienced during 1940.

Douglas Fir. In the autumn of 1939 further work was carried out on the rooting conditions for large Douglas fir in the New Forest. The stands investigated so far all grow on soils of the Ground-water class, in which the water-table is within reach of the tree roots. The evidence obtained so far indicates that the health of these 70- to 80-year-old trees increases as the depth of well-drained soil increases, but that die-back of roots is a possibility on any soil in which the water-table is within reach of the

roots even when at its lowest level. More data are needed before this subject can be adequately dealt with.

Larch Disease. No appreciable amount of work has been possible on this important problem. Some further reference to the subject is made below in discussing silvicultural research. It is hoped that the special investigations of war fellings of conifers, which are to be carried out during the summer and autumn of 1940, will throw further light on the incidence of butt rot in relation to soil and other conditions. As is well known, larch is one of the trees principally affected by butt rot.

Other problems under study in collaboration with Mr. Sanzen-Baker. Work of this nature was unavoidably suspended during much of the year, with the result that but little progress has been made with the problems in hand.

The study of root development in Ground-water soils in the New Forest was continued to some extent. These are soils in which seasonal wetness is experienced, and often seasonal drought at different soil levels and at different times of the year. Root activity tends thus to be limited to particular levels according to time of year and type of season. Soil fertility, as reflected in tree growth, seems to depend to a considerable degree on the extent to which a satisfactory zone for root activity is available at any time of year and during any season, however extreme. For this reason a study of the whole rooting profile is necessary if conditions for growth are properly to be understood.

The collection of information with regard to certain aspects of the growth of European larch is still proceeding, although owing to the present conditions it has been possible to make but little progress in this matter. It is hoped to make a preliminary report on the causes of the failure of young larch plantations during the course of the next year.

The final report on the afforestation of chalk downland has been delayed owing to war conditions. Work on it will be begun at the earliest possible moment.

The field work carried out by Mr. F. H. Jones in connection with deficiency diseases has indicated that potassium deficiency is a possible cause of chlorosis in Douglas fir in Cornwall. The war has prevented any attempt to prove this by removing the chlorosis through suitable field treatment.

Further trials in the Chiltern Hills have confirmed that chlorosis of beech growing on chalky soils is due to iron deficiency, not only at Streatley but also at other places. The trials carried out on the South Downs in young beech plantations show, however, that the chlorosis which commonly occurs there in beech which are still in a checked condition, is not due to iron

deficiency to any appreciable extent, even with trees growing on shallow chalky soils. Exposure and conditions related to seasonal water deficiency seem to provide the chief causes of chlorosis in this case.

Miscellaneous. Mr. Peace reports from the Forest of Dean that a canker disease of small oak, which has been under observation for some time, is not spreading at all and that the old cankers are healing. The cause of these cankers was never determined.

He also reports that the root-rot of *Thuja plicata*, referred to in the last report, has proved on clear felling to be less serious than was expected from the selected fellings of larger trees upon which the first reports were based. It would appear that the smaller trees tend to be less affected than the larger ones. Attempts to infect uninjured and healthy trees with *Fomes annosus* have failed so far. This was attempted in view of the fact that this fungus can sometimes be found penetrating trees which were, before infection, apparently in this condition.

Spraying with sea-water in various concentrations has shown that European larch, sycamore, ash, beech and oak are all susceptible to leaf scorch if so treated. It is not necessary for the spray to be concentrated to produce the effect, but a very considerable concentration is of course produced as the spray dries upon the leaves. It was proved previously that pines are not affected by such spraying. This is a matter of considerable importance in plantations made near to the coast, where salt spray is commonly carried over by wind and deposited on the plants.

Lectures. Owing to the illness and subsequent death of Professor Troup, Mr. Day became Deputy-Professor for a period and undertook special teaching. He thus lectured on Forest Economics, Forest Policy and carried out a practical course in Statistics (in collaboration with Mr. Van Rest as lecturer) in addition to his other duties.

Advisory Work. Owing to war conditions there has been very little advisory work during the year, and until attention in Forestry turns from felling to raising timber this state of affairs is expected to continue.

Publications. There have been no publications during the year. War conditions have been mainly responsible for this, together with the special administrative work and teaching referred to above.

ENTOMOLOGY.

The Entomology Section of the Institute has now been placed under the direction of the Hope Department of Entomology, but Dr. Chrystal continued the teaching work as hitherto. Mr. J. M. B. Brown continued in charge of the field investigations for H.M. Forestry Commission, and his report is summarized herewith:—

Chafer Grub Investigations. These comprised preliminary investigations into the possibilities of control of cockchafer damage by chemical means, and some biological observations on the activities of the adult beetles during the swarming period, together with laboratory observations with specially devised apparatus to study the daily activities of the beetles.

The chemical experiments were carried out at Kennington Nursery, at Perch and Nagshead Nurseries in the Forest of Dean, and in the New Forest. At Kennington, the object of the experiments was to test the poisonous effect on nursery plants of the various chemicals used together with their insecticidal effect on the chafer larvae. These experiments, which involved eight different substances, showed quite clearly which of these could not safely be used against chafer grubs without risk of harming the plants, and left a residue of three or four promising chemicals with which further tests will be made at a later date.

The experiments at Perch nursery were concerned with the treatment of chafer-infested turf with paradichlorobenzene and carbon disulphide. The experiments, which were carried out at the end of July, gave encouraging results. At Nagshead, an experiment on the effect of rototiller cultivation on chafer control did not give very definite results. This, and other experiments, however, reinforced the conclusion of the previous year, that intelligent crop rotation, together with fallowing and rotary cultivation of severely infested ground, should be the most economic general means of reducing losses caused by chafer grubs. In cases of very severe local attacks there is now a better prospect of finding an effective method of soil fumigation.

In the New Forest an experiment was again arranged in which naphthalene was tried as a deterrent to egg-laying by the cockchafer (*Melolontha*); the results of this will be assessed at a later date.

Pine Weevil Investigations. These were again located in the New Forest. The experiments were planned in anticipation of a great increase in the population of weevils consequent upon war emergency fellings. The experiments were designed to study how best to improve and cheapen the standard methods of trapping, to test the efficacy of alternative control methods, and

to find a cheap method of controlling weevil damage on naturally regenerated areas.

In the New Forest and in two or three large clearings in the Forest of Dean, very considerable damage was caused to the young crop by two smaller weevils, *Otiorrhynchus singularis* L. (*picipes* F.) and *Strophosomus coryli* F. In addition to these, another and rarer weevil, *Caenopsis fissirostris* Walt., was found in one area in the New Forest. These insects attacked oak, larch, Norway spruce and Corsican pine. They were readily attracted to the bundles of pine shoots used for trapping *Hylobius* and intensive measures were used to control them.

Lepidopterous Defoliators. A rapid survey was made in June of caterpillar defoliation in the Forest of Dean oak woods. Severe damage was caused on large areas of the central forest, but the High Meadow woods and much of the eastern side of the forest were only slightly affected. The three major pests, *Tortrix viridana* (the Oak Roller Moth), and the Winter Moths, *Cheimatobia* and *Hybernia*, were all abundant although the last two were generally restricted to the higher ground and hill sides, where they caused the most intense defoliation. This year's outbreak indicates an unusually rapid increase of the population as recorded in 1939.

WOOD STRUCTURE.

Dr. L. Chalk remained in charge of this Section. Dr. M. M. Chattaway left the Institute on the outbreak of the war and is serving in the army.

Owing to shortage of teaching staff and the demands of external duties connected with the war, very little time was available for research. Some progress was made in editing and completing the descriptions of those families that had already been investigated in connection with the study of the vegetative anatomy of the dicotyledons, but only one further family was added, viz. *Rosaceae*.

The number of identifications made during the year was 106. While the number of archaeological enquiries fell almost to nil, this was counterbalanced by the greater interest in Empire timbers engendered by war conditions. Approximately fifteen hundred specimens were received for the type collection, including a very valuable collection from Malaya; all these have not yet been entered. The collection, including specimens not yet entered, numbers over 15,500 specimens, representing some 1,700 genera and approximately 5,000 species. Ninety-eight slides of New Guinea timbers were received from the Division of Forest Products, C.S.I.R., Melbourne. Distributions in exchange were very much reduced in number.

FOREST UTILIZATION AND ENGINEERING.

At the end of 1939 Colonel A. H. Lloyd was given command of the Forestry Companies of the Royal Engineers. In his absence the usual School course of lectures on Forest Utilization was given by Dr. L. Chalk. Visits were paid to the sawmills of Henry Workman Ltd. at Woodchester, the Forest Products Research Laboratory at Princes Risborough and the turning industry in the woods near Hampden. Special thanks are due to the Director of the Laboratory and to F. E. Workman, Esq., for assistance in connection with these visits.

In the absence on war service of Colonel A. H. Lloyd, Mr. O. H. Chilton gave instruction in Forest Engineering. He also acted as Special Assessor and Special Examiner in Forest Engineering during the Trinity Term.

LIBRARY.

The number of books catalogued as additions during the year was 58; of pamphlets, reports and periodicals, 1,453. Loans totalled 2,459, made up as follows: to the Staff, 991; to the Bureau, 972; to students, 343; to outside borrowers (chiefly by post), 150. The number of loans to students was markedly smaller than in recent years, owing to the reduced number of men attending in this capacity. For the same reason, there were only two of the usual Michaelmas Term lectures explaining the library system, instead of five or six. Of readers in the library there were again about 600; of visitors, most of whom required references or loans, the number dropped to 108. Sales in the library amounted to £1 5s. *od.*; orders through Forestry Abstracts came to six, covering 31 items. The number of current periodicals now taken is 135, the total number of sets of periodicals being 204; Continental periodicals, including German ones, were obtained fairly regularly up to about March, 1940. Since there were fewer periodicals to bind, some headway was made with arrears of binding.

The library now holds, from Government and other research institutions both British and foreign, 693 separate series of bulletins (609 of these are in current receipt, 95 having been added this year), and 337 separate series of reports (224 of which are in current receipt, 22 having been added this year); a total of 1,030 series. Such material, comprising many thousands of items, is received chiefly in exchange for Institute and Bureau publications, and is exclusive of working-plans, non-serial pamphlets, and reprints. A considerable proportion is obtained by request; the items so obtained during the year came to 294, and correspondence is increasingly heavy. Assistance in the

work of correspondence was provided by the office staff on a part-time basis. Letters sent numbered 800; letters received, 564.

Close collaboration was maintained with the Imperial Forestry Bureau to the common benefit. The library has profited by the provision of copies of the Bureau record-slips, forming a current catalogue of immediate value. Inquiries are for the most part now dealt with by the Bureau; the exceptions, including telephone inquiries, numbered about a dozen. Data for the War-Time Guide to Scientific Literature (sponsored by the Association of Special Libraries and Information Bureaux) were supplied.

Soon after the outbreak of war, it became apparent that Part IV of the Forestry Bibliography, then ready for press, could not be published owing to increased expense and shortage of paper. Parts I, II, and III, already published, have had a considerable success, and it is still hoped that the completion of the project is only postponed and need not be abandoned.

In October the newly-constituted Library Committee met for the first time; several other meetings took place during the year, and afforded opportunity for fruitful discussion and direction. Some assistance was provided to the Librarian at intervals by members of the junior staff, and the Bibliographer, whose time had been taken over by the Documentation Officer on the cessation of the Bibliography, was allowed to give one hour daily to helping in library work.

The Bibliographer, under the supervision of the Documentation Officer, continued the work of reclassifying the library holdings according to the Flury decimal system, and of compiling an author index to material other than books. Approximately three thousand reference cards under author, subject and geographical headings were prepared during the year. The opportunity was taken to catch up with some of the arrears of references to the 1934 and 1935 material, caused by diversion of effort into preparing the Forest Bibliography for publication. Great assistance in the work of completing the references for these years was afforded by the lists received from various countries under the international scheme for indexing forest literature. A good deal of the librarian's time was taken up in dealing with questions and decisions arising from both these activities.

In August an inquiry into the technical management of the library, begun at the request of the librarian, was completed, and a Report was made by the investigators, Mr. H. F. Alexander (Superintendent of the Radcliffe Science Library) and Mr. H. R. Creswick (Deputy Librarian, Bodleian Library). Thanks are due to these gentlemen for the patience and care they devoted to this work.

During the year the Bodleian Library presented the Department with several excellent book-cases; these have been put into immediate commission. They are greatly appreciated; the problem of space, however, remains acute.

In addition to these book-cases, the library received a number of gifts during the year, and these are gratefully acknowledged. They consisted of useful books and pamphlets from the following donors: Mrs. B. C. Troup; Professor Champion; Dr. Chalk; Sir Alexander Rodger; Mr. Kissin; Mr. T. W. Summers; Mr. H. S. Single; Dr. J. S. Harley; Mr. A. M. Caccia; Mr. G. Watson; the Colonial Office; the High Commissioner for India; the Timber Commissioner for Eastern Canada; the Royal Geographical Society.

FINANCE.

The detailed accounts of the Department will be published, after audit, in the *Oxford University Gazette*. The following is a summary of income and expenditure for the year:—

INCOME: Forestry Commission, £2,889; Colonies, £4,904; Dominions, India and others, £625; Fees, £418; other receipts, £146. Total Income, £8,982.

EXPENDITURE: Staff salaries and pension contributions, £5,990; Instructional supplies, £134; Travelling, £205; Administrative, £945; Paid into Capital Account, £1,060. Total Expenditure, £8,334.

H. G. CHAMPION,

Professor of Forestry

(on behalf of the Committee for Forestry).

APPENDIX I

LIST OF STAFF.

I. STAFF ENGAGED IN INSTRUCTION AND RESEARCH.

- Professor H. G. CHAMPION, M.A. (Oxon.), Fellow of St. John's College. Tropical Forestry, Economics and Policy.
- J. BURTT DAVY, M.A., D.Phil. (Oxon.), Ph.D. (Cantab.), University College. Forest Botany and Ecology. (Till his death on 20th August, 1940.)
- *L. CHALK, M.A., D.Phil. (Oxon.), University College. Wood Structure and Properties.
- *W. R. DAY, B.Sc., M.A. (Oxon.), Exeter College. Pathology and Forest Hygiene.
- *A. H. LLOYD, M.C., M.A. (Oxon.), Exeter College. Forest Engineering and Utilization. (Absent on military duty from 1st September, 1939.)
- A. FOGGIE, B.Sc. (Edin.). Forest Management and Mensuration. (Joined on 27th April, 1940.)
- E. W. JONES, M.A. (Oxon.), Ph.D. (Cantab.), Magdalen College. Silviculture and Ecology.

II. STAFF ENGAGED SOLELY IN RESEARCH FOR THE FORESTRY COMMISSION.

- T. R. PEACE, M.A. (Cantab.). Pathology and Mycology.
- J. M. B. BROWN, B.Sc. (Belfast). Entomology.
- R. G. SANZEN-BAKER, B.Sc. (Edin.). Forestry Commission Research Officer for England and Wales. Silviculture.

III. STAFF OF OTHER UNIVERSITY DEPARTMENTS ASSISTING IN INSTRUCTIONAL WORK.

- *R. N. CHRYSTAL, D.Sc. (Edin.), Hon. M.A. (Oxon.). Forest Zoology.
- Professor T. G. B. OSBORN, M.A., Sherardian Professor of Botany, Fellow of Magdalen College. Ecology.
- A. C. HOYLE, B.Sc., M.A. (Oxon.), Pembroke College. Forest Botany and Ecology.
- O. H. CHILTON, M.A., M.Sc. (Lond.). Instructor in Surveying.
- C. G. T. MORISON, M.A. (Oxon.), University Reader in Soil Science. Student of Christ Church. Soil Science.
- G. R. CLARKE, B.Sc., M.A., Demonstrator in Soil Science, School of Rural Economy. Oriel College. Soil Science.
- H. S. WILLIAMSON, M.A. (Oxon.), Christ Church. Forest Law and Land Tenure.

IV. OTHER STAFF.

- Secretary-Accountant : Miss L. M. BISHOP.
- Assistant Secretary : Miss H. M. EDWARDS.
- Librarian : Miss G. GUINEY.

* These members of the staff have the status of University Demonstrators, having been reappointed as such with effect from the following dates : Mr. Lloyd, 1.10.34 ; the remainder, 1.10.36.

APPENDIX II

PUBLICATIONS, 1939-40.

BY THE STAFF.

- BURTT DAVY, J. Aboyna Wood. *Tropical Woods*, No. 59 (September, 1939), p. 51.
 Further Note on Amboyna Wood. *Tropical Woods*, No. 60 (December, 1939), p. 45.
 Dalbergia retusa. *Tropical Woods*, No. 62 (June, 1940), pp. 31-32.
 The Botanical Name of the Nargusta. *Tropical Woods*, No. 63 (September, 1940), p. 38.
- CHALK, L. The Imperial Forestry Bureau at Oxford. (*Empire Forestry Journal*, Vol. XIX, No. 1, pp. 62-8, 1940).
- CHATTAWAY, M. M. Crystalliferous strands. (*Rodriguesia*, Vol. XII, pp. 55-8, 1939).

IMPERIAL FORESTRY INSTITUTE PAPERS.

21. PETRINI, SVEN. Calculation of the value of the soil in forestry and calculation of the financial rotation of a forest stand. 1939. 1s.
22. FAIRBAIRN, W. A. Ecological Succession due to Biotic Factors in Northern Nano and Katsina Provinces of Northern Nigeria. 1939. 2s. 6d.

APPENDIX III

SPECIMENS RECEIVED, 1939-40.

WOOD COLLECTION.

Hand Specimens for Type Collection.

- EUROPE. *The British Isles*: Mr. C. W. Bond, 2; Dr. J. Burtt Davy, 4; Forest Products Research Laboratory, Princes Risborough, 11. *Germany*: Mr. E. Schmidt, 3.
- ASIA. *Ceylon*: Via Colonial Forest Resources Development Department, 14. *Malaya*: Forest Research Institute, Kepong, 1,648.
- AFRICA. *Kenya*: Via Forest Products Research Laboratory, Princes Risborough, 6.
- AMERICA. *British Honduras*: Via Forest Products Research Laboratory, Princes Risborough, 11.
- AUSTRALIA. Mr. M. B. Welch, 1; Via Dr. J. Burtt Davy, 1.

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